Space Weather Forecast

Issued on Wednesday, 29 March 2023 at 12:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of reaching G1/Minor Storm from late Day 2 (30th) into Days 3 and 4 (31st March and 1st April). Chance of isolated Moderate or stronger flares

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has reached High levels over the past 24 hours, following a Strong flare from the largest and most complex spot group in the southwest at 29/0233UTC.

There are seven numbered sunspots on the visible disc. A moderately large region in the southwest remains the largest and most magnetically complex group, although showing some decay in the trailer portion. Two groups located in the northwest quadrant, are also showing some minor decay within their intermediate spot regions.The other active regions appear stable and magnetically simple, with only minor fluctuations in areal extent. There are three small unnumbered potential spot regions on the disc, two towards the east limb, the other just west of central disc. There are also signs of some minor pores emerging from plage regions close to the east limb, which will continue to be monitored for any new spots developing.

A CME was observed in coronagraph imagery leaving the west limb just prior to the strong flare from the spot region in the southwest, with a further CME following the flare. Both are modest in speed, and modelling results confirm they are clearly directed ahead of the Earth orbit.

Solar Wind / Geomagnetic Activity: The solar wind was mostly at background levels. The interplanetary magnetic field was weak over the 24 hours, with the north-south component varying weakly, although often south orientated. The net result of the above solar wind measures was for Quiet (Kp 0-2) geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be predominantly Low, but with a Chance of further isolated M-class or stronger flares. The main region likely to give such flares is the largest and most complex in the southwest.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections (CMEs) currently feature in the forecast.

Solar winds are expected to remain at background levels until the next coronal hole 88 becomes geoeffective, possibly arriving late on day 2 (30th), and continuing into days 3 and 4 (31st March and 1st April). Geomagnetic activity will initially be mostly Quiet (Kp 0-2) with the slight chance of an Unsettled interval (Kp 3) during day 1 (29th) and into day 2 (30th). Later on day 2 (30th) and more especially into days 3 and 4 (31st March to 1st April), we are likely to see the arrival of the

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fast wind from coronal hole 88. Geomagnetic activity is likely to increase to Unsettled (Kp 3) with Active (Kp 4) intervals with a Chance of G1/Minor geomagnetic storms (Kp 5).

Energetic Particles / Solar Radiation: No solar radiation storms are expected, but there remains a slight chance of reaching S1 or greater, should any significant flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	40	40
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	Yes	5	5	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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